PRICE $5.00

INSTRUMENT
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AERONUTRONIC-FORD MOTOR CO.

POWER SUPPLY

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INSTRUMENT
LAB
AERONUTRONIC-FORD MOTOR CO.

INSTRUCTION MANUAL

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131-38 SANFORD AVENUE • FLUSHING 52, N. Y.
Area Code 212 IN 1-7000 • TWX # NY 4-5196

INSTRUCTION MANUAL:

MODEL SC 32-10A

SERIAL NO. .....

KEPCO, INC.
131 - 38 Sanford Avenue
Flushing 52, New York

Kepco, Inc.
Flushing, New York

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KEPCO, INC.
131 - 38 Sanford Avenue
Flushing 55, New York

SEMI-CONDUCTOR

VOLTAGE REGULATED POWER SUPPLY

MODEL SC-32-10

SPECIFICATIONS:

OUTPUT VOLTAGE DC: 0-32 volts continuously variable.

OUTPUT CURRENT DC: 0-10 amperes continuous duty.

REGULATION: In the range 0-32 volts, the output voltage variation is less than 0.01% or 0.002 volt, whichever is greater, for load variation from 0 to 10 amperes, and less than 0.01% for line fluctuation from 105-125 volts.

RIPPLE VOLTAGE: Less than 1 millivolt RMS.

RECOVERY TIME: 50 microseconds.

STABILITY: The output voltage variation for a period of eight hours is less than 0.01% or 0.002 volt (whichever is greater). When this unit is turned on from a cold start, approximately 3/4 of an hour is required for the unit to reach equilibrium. The drift during the 3/4 hour period is less than 1%.

AMBIENT OPERATING TEMPERATURE: 50°C maximum. Over-temperature protection provided. Unit turns off when over-temperature occurs. Power on-off switch on front panel resets unit.

TEMPERATURE COEFFICIENT: Output voltage changes less than 0.01% per °C.

OUTPUT IMPEDANCE: Less than 0.001 ohm from DC to 1 KC. Less than 0.01 ohm from 1 KC to 100 KC.

SHORT CIRCUIT PROTECTION: When the load exceeds the maximum output current by 20%, a transistor amplifier automatically increases the impedance of the series pass transistors so that their wattage dissipation rating is never exceeded. A control which is available at the rear of the unit can be adjusted so that the over-current can be set to 120% of full load.

FUSE PROTECTION: Input fuse on front panel.

The negative reference supply and amplifier is separately fused. This fuse is located on the rear apron of the chassis and is labelled REF. fuse. This fuse has been designed into this unit to protect the reference amplifier in the event of any internal failure.

The voltage control circuit is separately fused. This fuse is located on the rear apron of the chassis and is labelled POT. fuse. This fuse has been designed into this unit to protect the 10 turn voltage control in the event of any internal failure or accidental removing of jumper bars on the rear terminations when the unit is operating.

POWER REQUIREMENTS: 105-125 volts, 50-65 cycles.

OUTPUT TERMINATIONS: DC terminals are clearly marked on the front panel. All terminals are isolated from the chassis. Either positive or negative terminal of the DC output may be grounded. A terminal is provided for connecting to the chassis. The DC terminals are also brought out to a barrier terminal board at the rear of the unit.

Two terminals on the rear terminal board are provided for remotely sensing the error signal directly at the load. This connection compensates for the voltage drop in the wires connecting the power supply to the load.

METERS: Voltmeter: 0-50 volts, 2-1/2" wide view.

Ammeter: 0-10 amperes, 2-1/2" wide view.

CONTROLS: Power on-off switch, ten turn voltage control on front panel; overload current control at the rear of the unit.

PHYSICAL SPECIFICATIONS: Height 8-3/4", width 19", depth 14-3/8", color Kepco standard gray hammertone. This unit is designed for bench use or relay rack mounting. Carrying handles are provided on the front panel.

OPERATING INSTRUCTIONS: This Semi-Conductor Voltage Regulated Power Supply is shipped without any internal packing material and may be put into operation immediately.

The remote error sensing terminals are connected directly to the rear output terminals by means of jumper bars on the barrier terminal board. The power supply is, therefore, set up for best regulation at either the front or rear output terminations.

PROCEDURE FOR OPERATING POWER SUPPLY FOR NON-REMOTE ERROR SIGNAL: Turn on the power switch. Adjust the DC voltage control to the desired output voltage. The load may either be connected to the front DC output terminals or the rear DC output terminals. If the load is connected to the rear output terminals, the voltage across the front panel output terminals is regulated for load except for the very small drop in wires connecting front to rear terminals.

PROCEDURE FOR OPERATING POWER SUPPLY FOR REMOTE ERROR SIGNAL: With the power supply turned off, remove the jumper bars from the remote error terminals located on the rear terminal board. Use twisted

pair wire for connecting the + and - output terminals from the rear of the chassis to the load. Use another set of twisted pair wires connecting the + and - remote error signal terminals to the load contacts. (See Figure I.)

REMOTE ERROR CONNECTIONS

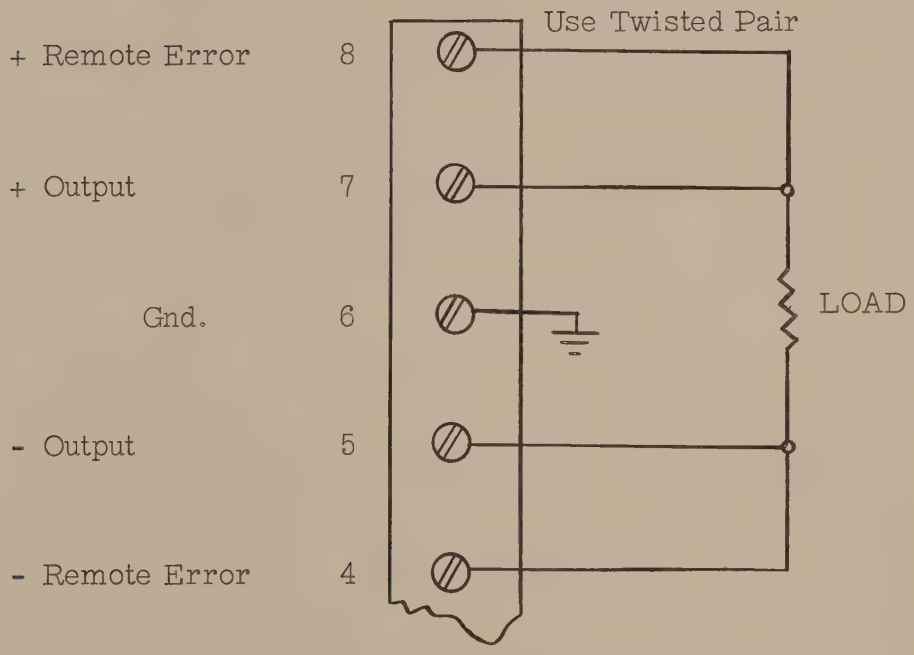


FIGURE I.

OVERLOAD PROTECTION DEVICE: The automatic current limiting device in this unit is part of the regulator amplifier circuit. When the current exceeds a pre-set value, the control amplifier increases the impedance of the pass elements so that the current never exceeds this pre-set value. This current has been set at approximately 120% of the maximum output current. Should it become necessary to readjust this overload current setting, a

potentiometer, labelled "Current Limit Adjust", is available at the rear of the unit. This control should be set to 120% of the maximum current rating of the power supply.

OVER-TEMPERATURE PROTECTION: In the event of fan failure or accidental blocking of air vents, a temperature measuring device mounted on one of the series pass transistor elements will automatically turn the power supply off when the temperature is excessive. Check to see whether the air vents are blocked or the fan is rotating. The fan should be operating even though the power supply has been turned off by the over-temperature protection device. To turn the power supply on again, once an over-temperature condition has occurred, remove the external load from the power supply and wait approximately 3 to 5 minutes for the unit to cool off. After this interval turn the power switch OFF and then ON again. If the power goes off the unit has not cooled to a safe operating temperature. If the fan is operating properly and the air vents are clear, there may be internal failure and the internal difficulty should be removed in accordance with the Maintenance and Repair instructions.

If the supply is operating properly, re-apply the load and let the unit operate for 10 to 15 minutes. Continued safe operation of the power supply may then be expected. If the supply shuts down with a load not exceeding the rated value of the supply, the unit should be serviced in accordance with the Maintenance and Repair instructions.

MAINTENANCE: The components of this Semi-Conductor Regulated Power Supply have been selected and tested to provide long and trouble free oper-

ating life. Replacement of transistors may be necessary on rare occasions. The transistors in the regulated reference supply and in the reference amplifier are easily accessible by removing the rear cover plate. This cover plate is fastened with six screws. The pass transistors are of a plug-in type and are accessible by removing the top cover plate. Each plug-in pass transistor is retained by two screws. Access to these screws can be achieved by removing the bottom cover.

Maintenance should be done only by qualified personnel who know transistor regulator circuitry. Serious and costly damage can result from inexperienced probing in the unit.

REPAIRS: Should any trouble develop in the instrument, it may be serviced with the aid of the schematic diagram. Major repairs, however, are usually handled by the factory.

Under no circumstances should the instrument be returned to the factory without proper authorization and shipping instructions. In any correspondence with the factory concerning repairs, the type and serial number of the instrument must be given together with a description of the trouble encountered.

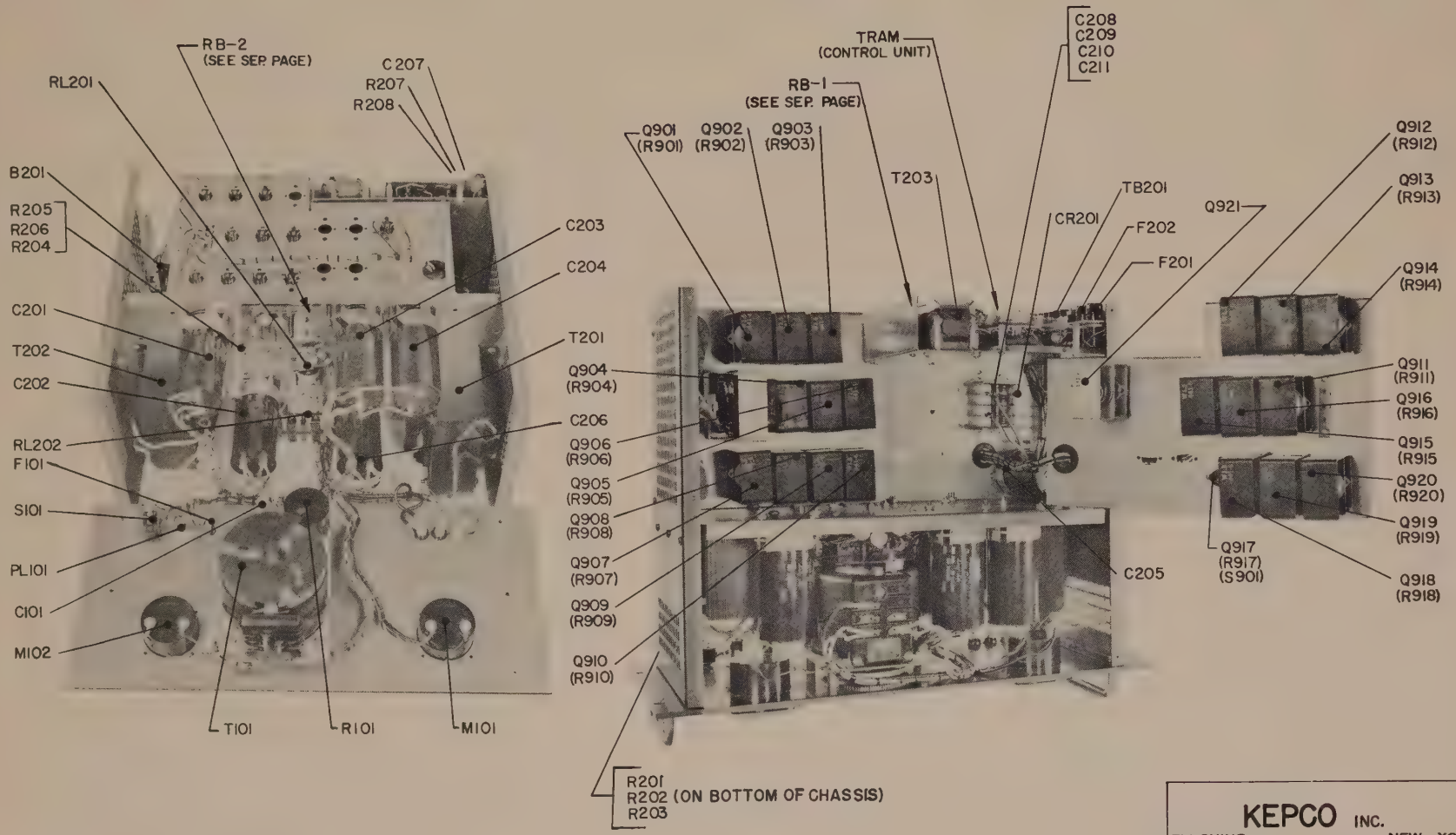
Schematic Part No.	Kepco Part No.	Description	Specifications	Mfr.	Mfr's. No.
B201	148-0017	Motor, Fan		Brevel	M14P1C3-1128B
		Capacitors:			
C101	117-0207	Mylar	1 µf 200v 10%	Hopkins Eng.	1P2MK
C201-204	117-0192	Electrolytic, Can Type	2400 µf 65v +100-10%	Industrial Cond.	1B1002RRB
C205, 206	117-0159	Electrolytic, Can Type	4200 µf 50v +100-10%	Industrial Cond.	1B913RRB
C207	117-0087	Ceramic	0.1 µf 500v + 80-20%	Sprague	41C92
C208-211	117-0123	Mylar	0.5 µf 200v 10%	Hopkins Eng.	P52MK
C301, 302	117-0156	Electrolytic, Pigtail Type	500 µf 12v +100-10%	Industrial Cond.	1B1065
C303	117-0114	Electrolytic, Pigtail Type	350 µf 50v +100-10%	Industrial Cond.	1B844
C304	117-0140	Electrolytic, Pigtail Type	100 µf 150v + 50-10%	Industrial Cond.	10B916RM
C305, 306	117-0128	Mylar	0.4 µf 200v 10%	Hopkins Eng.	P42MK
C401, 403	117-0147	Electrolytic, Pigtail Type	10 µf 150v + 50-10%	Industrial Cond.	10B912RM
C402	117-0107	Mylar	0.22 µf 200v 20%	Good-All	620S22402W
CR201	124-0074	Rectifier, Silicon, Stack Type	F. W. Bridge; 15 A	Trans-Sil	4T1015B1S1
CR301-306	122-0007	Rectifier, Germanium, Pigtail Type		General Electric	1N91
CR307-310, 401, 402	124-0028	Rectifier, Silicon, Pigtail Type		Automatic Mfg.	PT-5
F101	141-0010	Fuse, Instantaneous	15 a 250v	Bussmann	ABC-15
F201	141-0005	Fuse, Instantaneous	1/4 a 250v	Bussmann	AGC-1/4
F202	141-0009	Fuse, Instantaneous	1-1/2 a 250v	Bussmann	AGC-1-1/2
M101	135-0168	Meter	0-10 a dc 2-1/2"	General Elec.	8DW91A229BW2
M102	135-0138	Meter	0-50 v dc 2-1/2"	General Elec.	8DW91V201AR2

Schematic Part No.	Kepco Part No.	Description	Specifications	Mfr.	Mfr's. No.
PL101	153-0024	Pilot Light, Neon		General Elec.	NE-51
Q301	119-0022	Transistor, PNP		Tung-Sol	2N382
Q901-921	119-0016	Transistor, PNP		Delco	119-0016
		Resistors:			
R101	115-0420	Variable, Multiturn	10 K ohm 1.25 w 3%	Helipot	AR10KL.25
R201	115-0798	Advance Wire	0.05 ohm 10 w	Kepco	115-0798
R202	115-0184	Fixed, Power, Strip	250 ohm 40 w 5%	Ward Leonard	40S250
R203	115-0594	Fixed, Power, Strip	100 ohm 40 w 5%	Ward Leonard	40S100
R204, 206	115-0551	Fixed, Power, Strip	500 ohm 20 w 5%	Ward Leonard	20S500
R205	115-0727	Fixed, Power, Strip	10 ohm 20 w 5%	Ward Leonard	20S10
R207, 208, 305	115-0718	Fixed, Molded	47 ohm 1/2 w 10%	Allen-Bradley	EB4701
R301	115-0773	Fixed, Power, Axial	30 ohm 3 w 5%	Ward Leonard	3X30
R302	115-0608	Fixed, Molded	470 ohm 1/2 w 10%	Allen-Bradley	EB4711
R303	115-0074	Fixed, Molded	2 K ohm 2 w 5%	Allen-Bradley	HB2025
R304	115-0439	Fixed, Molded	3.3 K ohm 1/2 w 10%	Allen-Bradley	EB3321
R306	115-0581	Fixed, Molded	430 ohm 1/2 w 5%	Allen-Bradley	EB4315
R401	115-0776	Fixed, Molded	82 K ohm 1/2 w 10%	Allen-Bradley	EB8231
R901-920	115-0517	Fixed, Power, Axial	1.5 ohm 3 w 5%	Ward Leonard	3X1.5
RL201	140-0038	Relay	4PDT	Ohmite	DOX-53T
RL202	140-0037	Relay	SPDT	Potter & Brumfield	MP-5A
S101	127-0012	Switch, Toggle	SPST	Cutler-Hammer	7501-K13
S901	127-0093	Switch, Thermostat	N.C.	Chatham Cont.	DRSCORP73C
T101	175-0331	Transformer, Variable		Superior Elec.	Q116U
T201	100-1141	Transformer		Kepco Magnetics	100-1141
T202	100-1140	Transformer		Kepco Magnetics	100-1140
T203	100-1039	Transformer		Kepco Magnetics	100-1039

PARTS LIST - MODEL SC 32-10A
POWER UNIT DRAWING DM00318

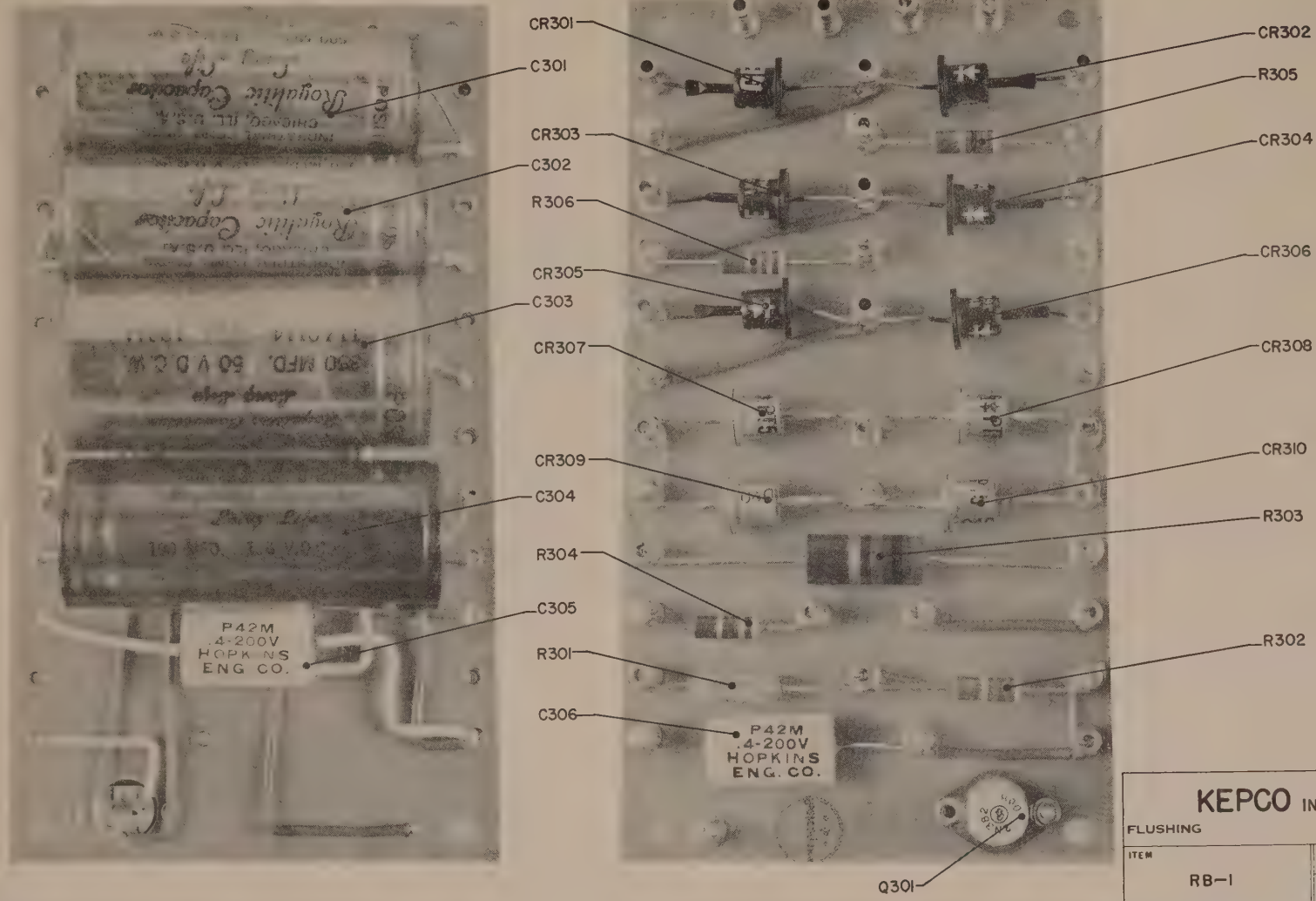
Schematic Part No.	Kepco Part No.	Description	Specifications	Mfr.	Mfr's. No.
		Capacitors:			
C1	117-0105	Electrolytic, Pigtail Type	25 µf 25 v +100, -10%	Industrial Cond.	1B1063
C2	117-0129	Mylar	2 µf 200 v 10%	Hopkins Eng.	2P2MK
C3	117-0128	Mylar	0.4 µf 200 v 10%	Hopkins Eng.	P42MK
C4	117-0087	Ceramic	0.1 µf 500 v + 80, -20%	Sprague	41C92
Q1	119-0016	Transistor, PNP		Delco	119-0016
Q2, 3, 4, 5, 6, 8, 12, 11	119-0022	Transistor, PNP		Tung-Sol	2N382
Q7	119-0007	Transistor, NPN		Gen. Transistor	2N35
Q9, 10	119-0024	Transistor, NPN		Gen. Transistor	GT1092
		Resistors:			
R1	115-0439	Fixed, Molded	3.3 K Ω 1/2 w 10%	Allen-Bradley	EB3321
R2	115-0466	Fixed, Molded	2.2 K Ω 1/2 w 10%	Allen-Bradley	EB2221
R3, 4, 11	115-0459	Fixed, Power, Axial	500 Ω .3 w 5%	Ward Leonard	3X500
R5, 15, 22	115-0467	Fixed, Molded	4.7 K Ω 1/2 w 10%	Allen-Bradley	EB4721
R6, 7, 10	115-0469	Fixed, Power, Axial	2.5 K Ω 3 w 5%	Ward Leonard	3X2500
R8	115-0460	Fixed, Power, Axial	10 K Ω 3 w 5%	Sprague	151E-10K
R9	115-0473	Fixed, Molded	1.8 K Ω 1/2 w 10%	Allen-Bradley	EB1821
R12	115-0736	Fixed, Precision	1.8 K Ω 1/2 w 1%	Dale	WS-1/2
R13, 14	115-0471	Fixed, Power, Axial	100 Ω 3 w 5%	Ward Leonard	3X100
R16	115-0371	Fixed, Molded	220 Ω 1/2 w 10%	Allen-Bradley	EB2211
R17	115-0502	Fixed, Molded	10 Ω 1/2 w 10%	Allen-Bradley	EB1001
R18	115-0547	Fixed, Molded	1 K Ω 1/2 w 10%	Allen-Bradley	EB1021
R19	115-0782	Fixed, Molded	1.6 K Ω 1/2 w 5%	Allen-Bradley	EB1625
R20	115-0560	Fixed, Molded	2.7 K Ω 1/2 w 10%	Allen-Bradley	EB2721

Schematic Part No.	Kepco Part No.	Description	Specifications	Mfr.	Mfr's. No.
		Resistors:			
R21	115-0783	Fixed, Molded	300 Ω 1/2 w 5%	Allen-Bradley	EB3015
R23	115-0718	Fixed, Molded	45 Ω 1/2 w 10%	Allen-Bradley	EB4501
R24	115-0474	Fixed, Molded	4.7 Ω 1/2 w 10%	Allen-Bradley	EB47G1
R25	115-0600	Variable, Composition	300 Ω 2 w 10%	Allen-Bradley	JA1L040S301UZ
R26	115-0803	Fixed, Power, Axial	200 Ω 3 w 5%	Ward Leonard	3X200
RD1	121-0001	Zener Diode		Hoffman	1N429



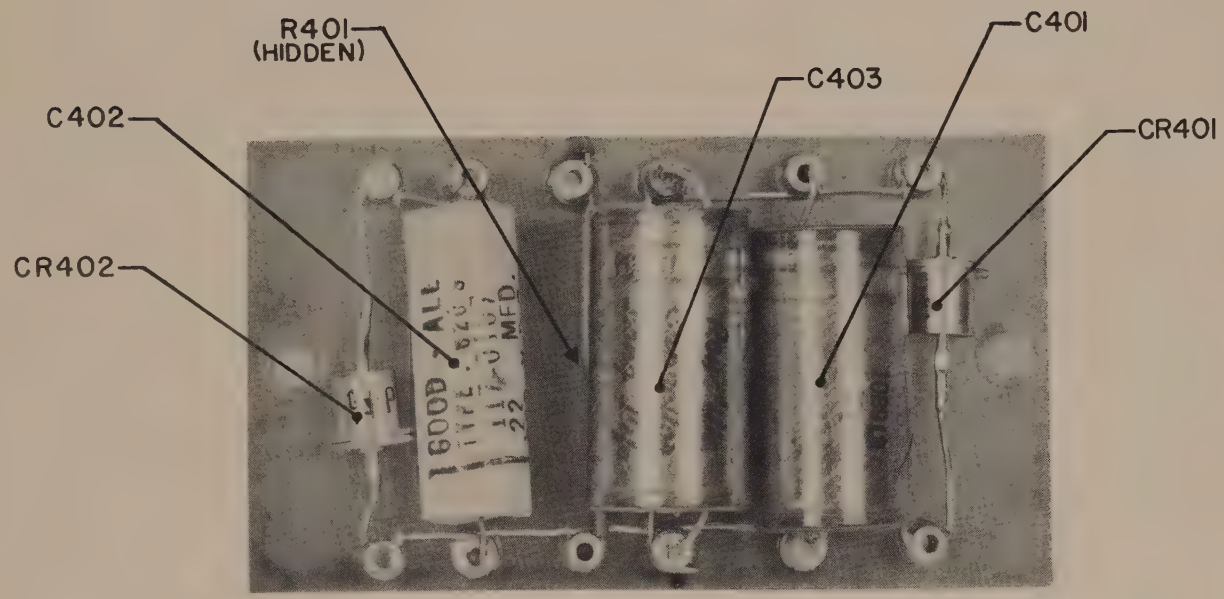
CORRECTIONS, IF ANY, APPEAR ON SHEET ATTACHED TO REAR COVER

KEPCO INC.	
FLUSHING NEW YORK	
ITEM: POWER UNIT	DES. 12-29-60
	APPD.
MODEL SC-32-10A	DFTM M. CEA
DWG. No. BM00916	CHKD



CORRECTIONS, IF ANY APPEAR ON SHEET ATTACHED TO REAR COVER

KEPCO INC.	
FLUSHING NEW YORK	
ITEM RB-1	DES. 12-29-60
	APPD Cybulski
MODEL SC-32-10A	DFTM M.CEA
DWG. No BM00920	CHKD T. Dd

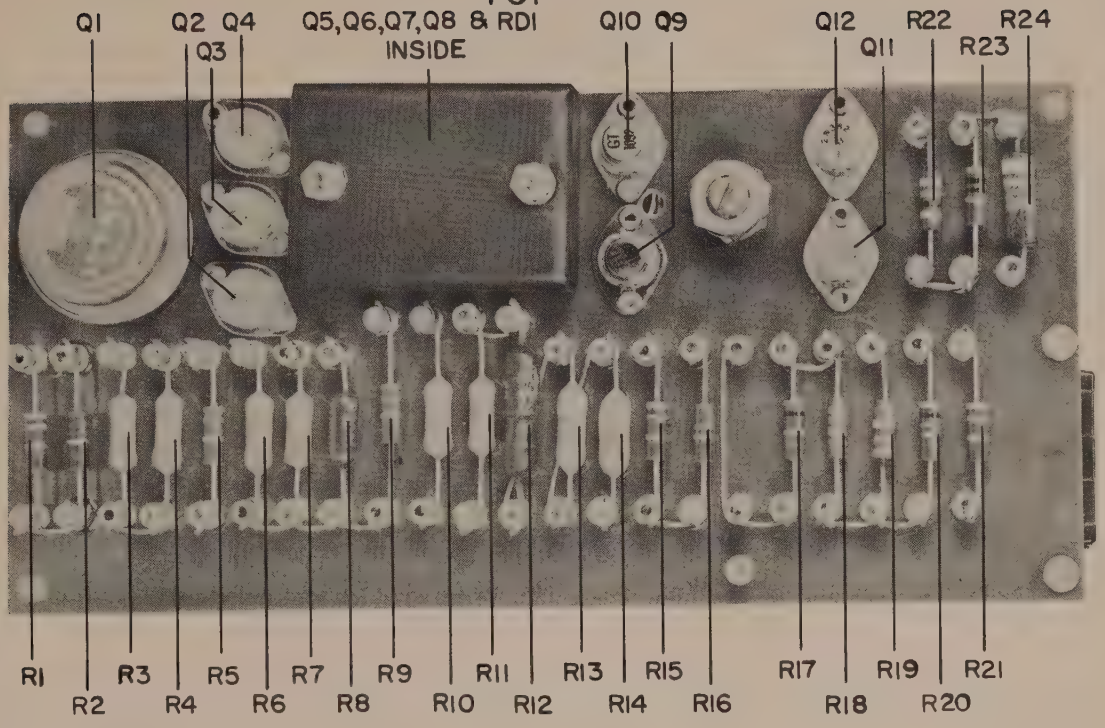


CORRECTIONS, IF ANY, APPEAR ON SHEET ATTACHED TO REAR COVER

KEPCO LABORATORIES	
FLUSHING	NEW YORK
ITEM RB—2	DES.
	APPD Engineering
MODEL SC-8 3/4 SERIES	DFTM R.C. 12-8-60
DWG. No. AM00875	CHKD T. Del

TRAM 8

TOP



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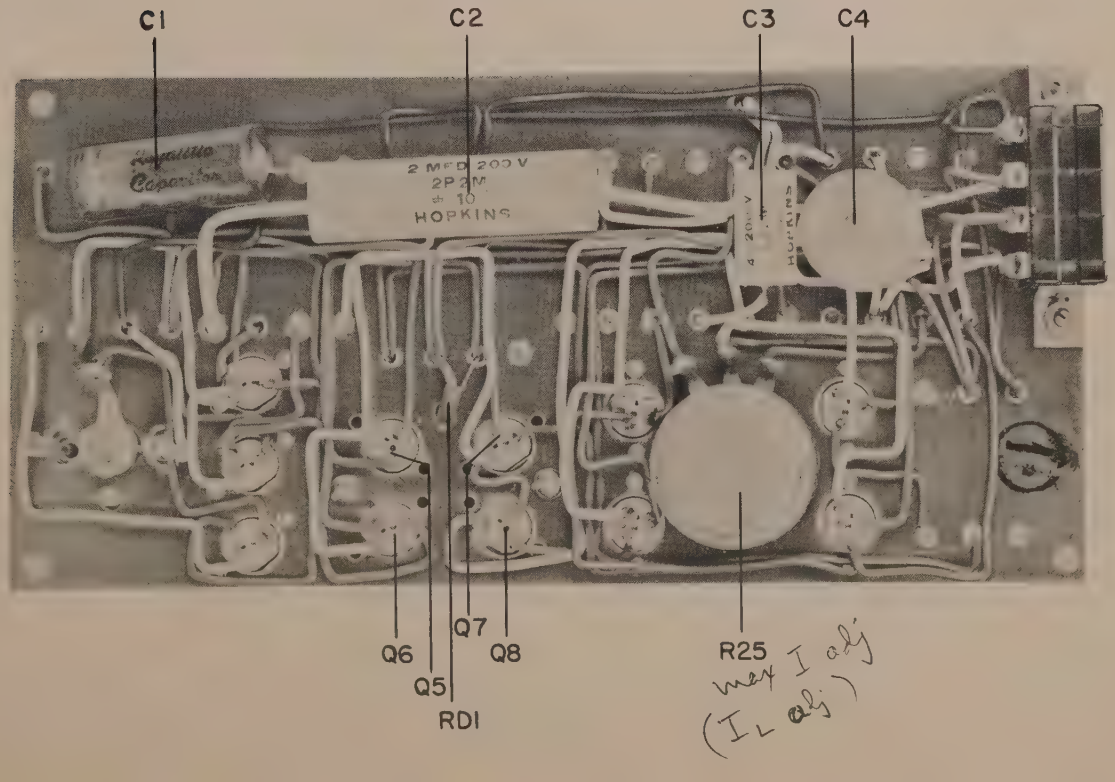
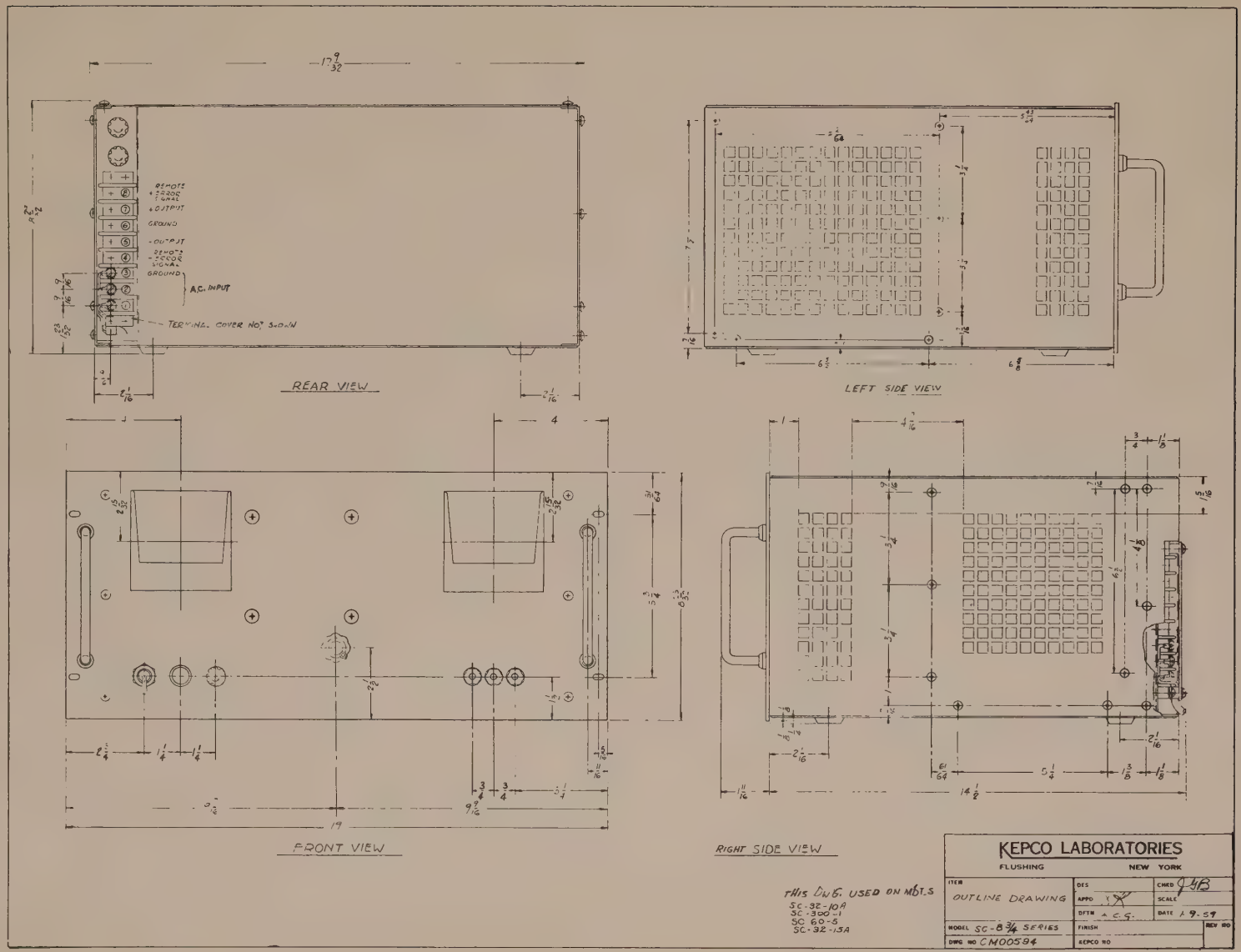
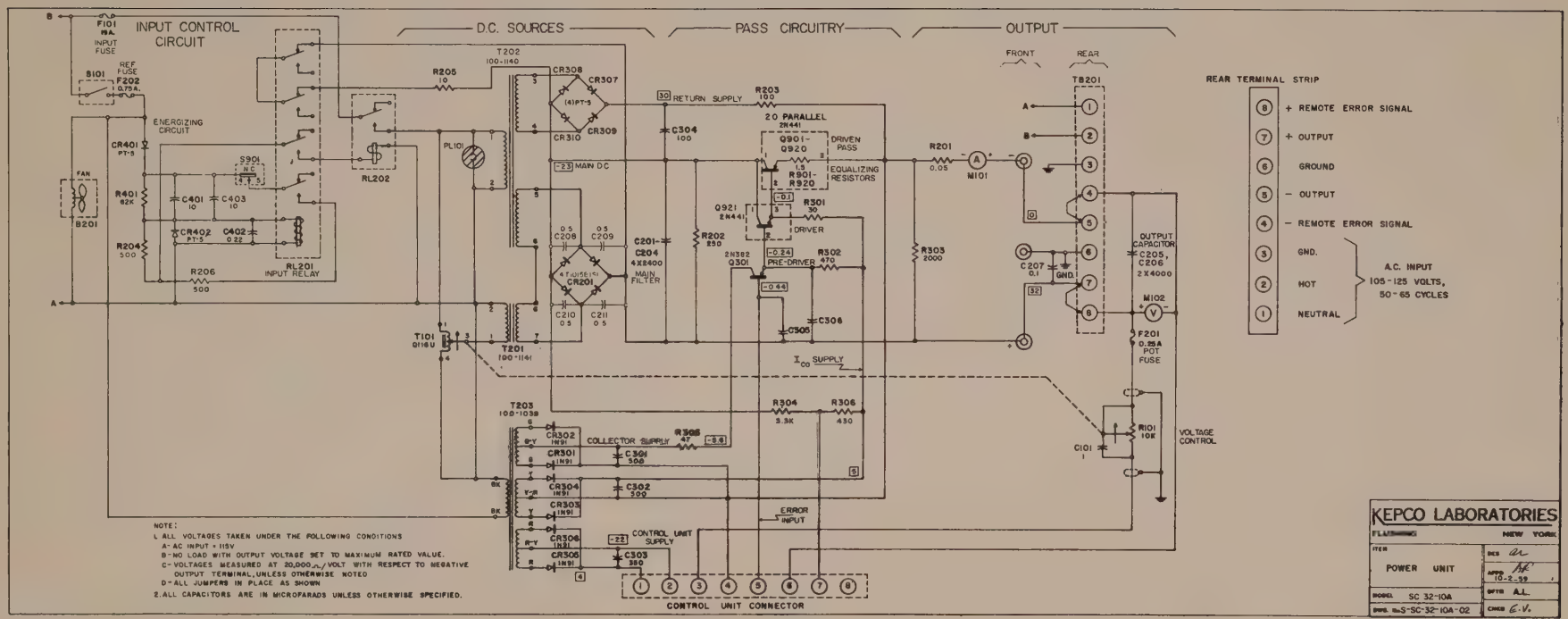




THIS DWG. USED ON MDLS
SC-32-10A
SC-300-1
SC 60-5
SC-32-15A

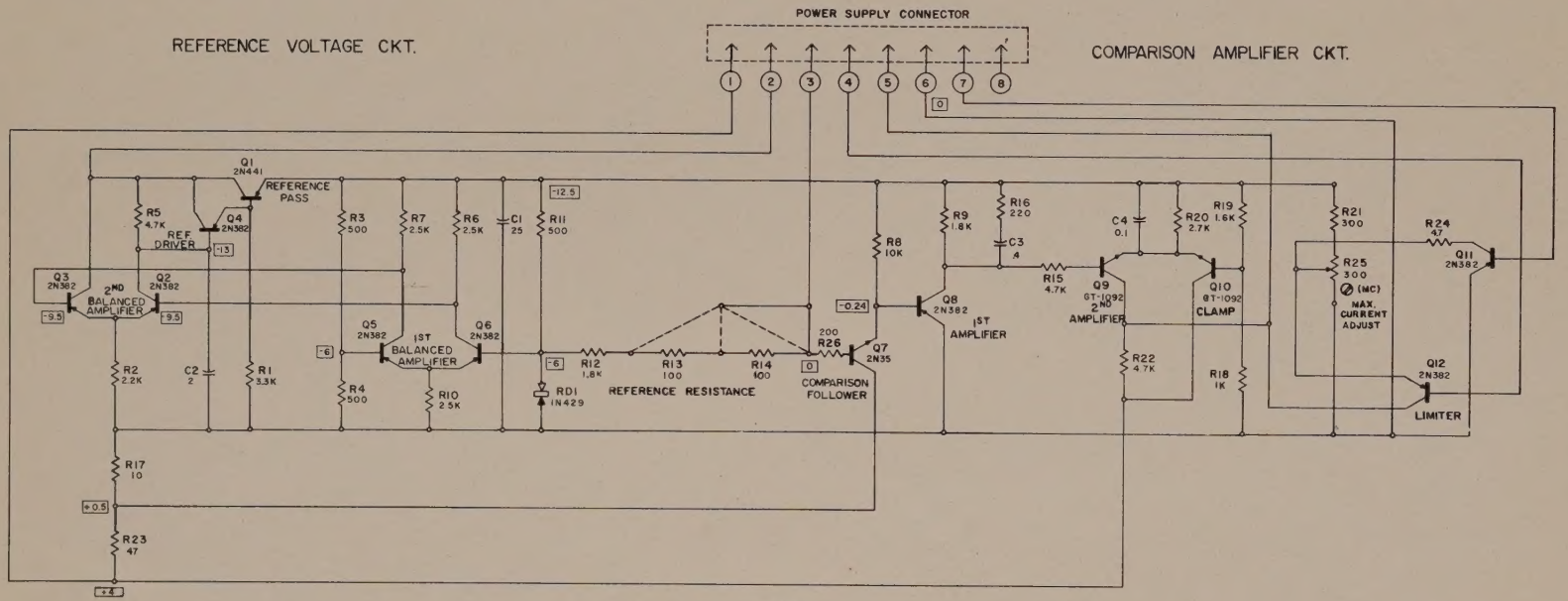
KEPCO LABORATORIES			
FLUSHING		NEW YORK	
ITEM: OUTLINE DRAWING	DES	CHKD: JHB	
	APPD: Y	SCALE	
	DFTM: A.C.S.	DATE: 9-59	
MODEL: SC-8 3/4 SERIES	FINISH		REV NO
DWG NO: CM00594	KEPCO NO		

ORDER REPLACEMENT PARTS BY KEPCO PART NUMBER
PROVIDED IN PARTS LIST SECTION



See Correction Sheet On
Inside Back Cover.

ORDER REPLACEMENT PARTS BY KEPCO PART NUMBER
PROVIDED IN PARTS LIST SECTION

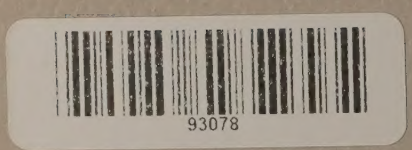


NOTE:
1. ALL VOLTAGES TAKEN UNDER CONDITIONS SPECIFIED ON MAIN SCHEMATIC.
2. ALL CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
3. REFERENCE RESISTANCE MAYBE R12 IN COMBINATION WITH EITHER OR BOTH OF R13, R14.

KEPCO LABORATORIES	
FLUSHING	NEW YORK
ITEM: CONTROL UNIT	DES
	APPV 11-16-59
MODEL TRAM 8	DFTM A.L.
DWG No S-TRAM 8-01	CHKD

CORRECTION SHEET FOR INSTRUCTION MANUAL

MATERIAL AFFECTED	CORRECTION
Power Unit Schematic	Add the following: 1. Resistor R207, 47 Ω from (+) Remote Error Signal to (+) Output terminals. 2. Resistor R208, 47 Ω from (-) Remote Error Signal to (-) Output terminals. Physical location: on back of rear terminal strip. 3. Change F202, fuse, from .75A to 1.5A.



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